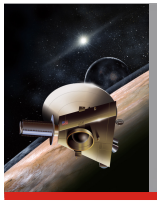
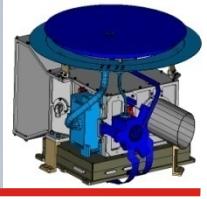


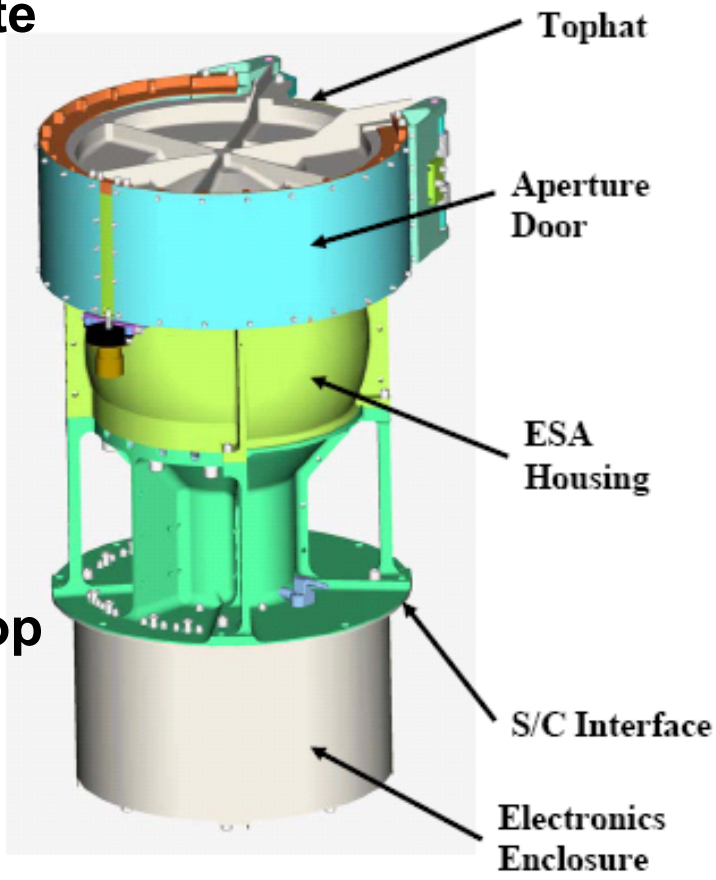
New Horizons P/L Technology Adaptation



- **There was little new technology developed for the NH science payload.**
  - Difficult to get selected proposing a payload with technology development requirements.
  - Most instrument new technology development is done on grants or internal research funding well in advance of an AO.
- **However, there was a good bit of technology adaptation.**
  - Need to the use of “newer” technologies was driven mainly by the need to keep mass and power requirements to a minimum.
  - Consideration was given at every step to the schedule impact of any use of less than mature technology.
- **Charts following show some specific examples of the adaptation of newer technologies to save mass and/or power.**

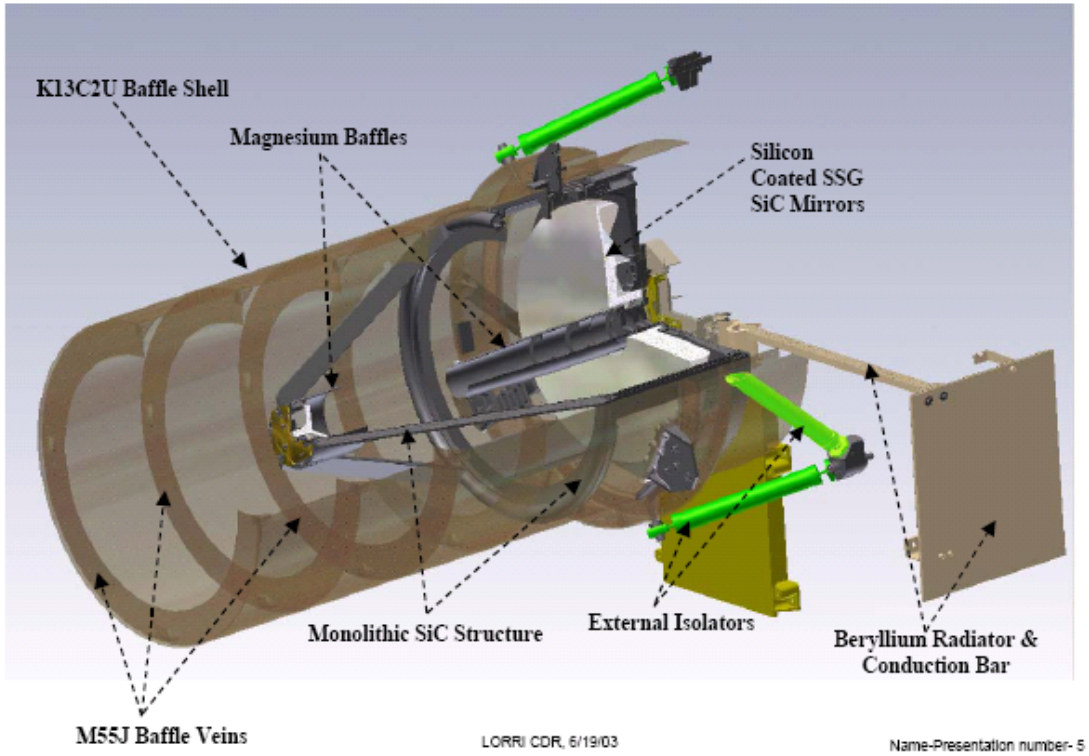
SWAP Technology Issues

- For SWAP it was necessary to develop a new manufacturing technology to fabricate the RPA grid at the entrance to the analyzer.
- Tried to make a four layer RPA grid that was free-standing so that there was no obstruction in our 270 deg FOV.
- Tried several methods and vendors (electroforming, laser cut, etc.)
- In the end, nothing could survive our vibration environment until we a local shop figure out how to drill hundreds of thousands of close-packed 13.5 mil holes on 15 mil centers leaving 1.5 mil web.



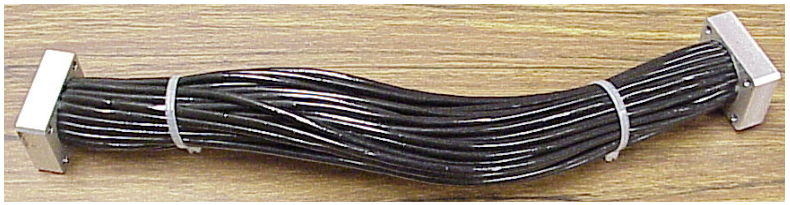
LORRI Technology Adaptation

- For LORRI the technology adaptation was the SiC optics.
- The original design of LORRI did not use SiC optics and was seriously overweight.
- The CCD detector was a conventional device from E2V.
  - Cooling was a challenge.
  - A BeCu bar from the back side of the detector to a dedicated radiator was used for thermal control.



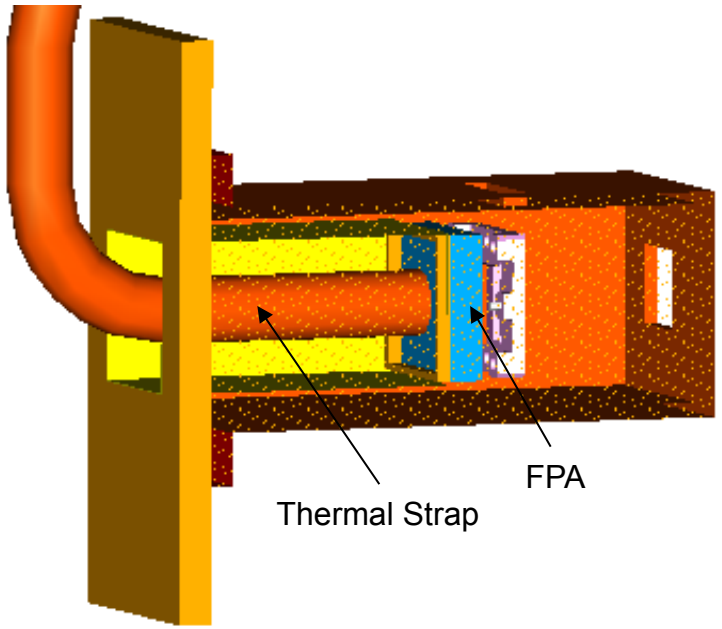
Ralph Technology Adaptation Issues
Thermal Straps/FP Interface

- **Design challenges of thermal straps**
  - Available length
  - Heat load to move
  - Interface design
  - Relative location of cryogenic radiator to FP assemblies (LEISA and MVIC)
- **K1100 strap made from K1100 fibers**
  - Selected for large thermal conductance and small mass
- **Three straps required**
  - 95 K LEISA FP to radiator
  - 150 K MVIC FP to radiator
  - 150 K LEISA shield to radiator
- **Strap will mount to their respective mounting surface with indium**
- **Will utilize strap design conducted on past programs**
- **Will conduct thermal qualification performance test of strap**
- **Will vibe straps with MVIC/FPA package assembly vibe**



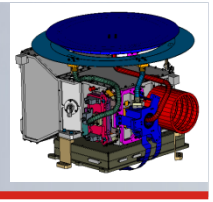
K1100 Thermal Straps

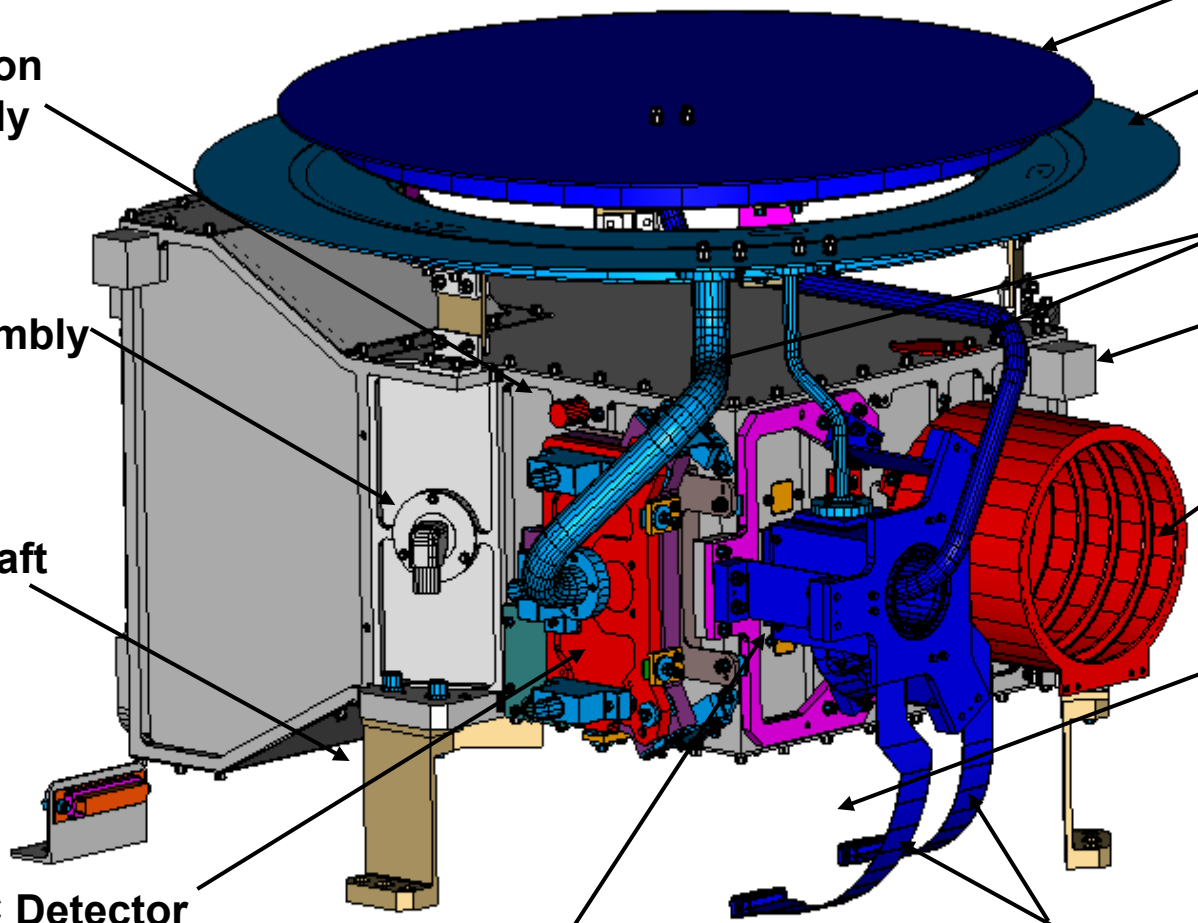
- Consists of individual tubes, each containing 10,000 K1100 fibers
- End fittings designed to allow maximum, perpendicular heat flow into individual fibers



LEISA FP Thermal Strap

Telescope Detector Assembly (TDA)





Cold Radiator

Warm Radiator

Solar Illumination Assembly

Thermal Straps

Alignment Cube

Purge Assembly

Aperture Baffle

3X Spacecraft Flexures

Ralph Electronics (previously shown)

MVIC Detector Package

LEISA Detector Package

LEISA Detector Cabling